

What Is Claimed Is:

1 1. A fast time-sequential color-separating device
2 including a plurality of modules sequentially connected to each
3 other, in which each module includes a dichroic mirror, which
4 can pass a certain wavelength range of light having a first
5 polarization and reflect the other wavelength range of light
6 having a first polarization, a polarizing beam-splitter for said
7 certain wavelength range and a liquid crystal panel that can
8 change the polarization of a light reflected by the liquid
9 crystal panel if an external electric field is applied thereto,
10 wherein the light having a first polarization reflected by the
11 liquid crystal panel is reflected along the incident optical
12 path while no external electric field is applied to the liquid
13 crystal, the light having a first polarization reflected by the
14 liquid crystal panel becomes a light having a second
15 polarization if an external electric field is applied thereto,
16 the light having a second polarization is then reflected by the
17 polarizing beam splitter and is emitted along a direction that
18 is orthogonal to the incident light, various modules passing
19 various wavelength ranges are connected one by one, an external
20 electric field is sequentially applied to the liquid crystal
21 panel of each module, so that various wavelength ranges of lights
22 having a first polarization is turned to lights having a second
23 polarization and are sequentially emitted along the direction
24 orthogonal to the incident light.

1 2. The color-separating device as claimed in claim 1
2 wherein the liquid crystal panel is a ferroelectric liquid
3 crystal panel..

1 3. The color-separating device as claimed in claim 1
2 wherein the various wavelength ranges include the wavelength
3 ranges of red light, green light and blue light.

1 4. A fast time-sequential color-separating device
2 including:

3 a prism module for separating an incident light into
4 various wavelength ranges of light beams which are emitted from
5 various prisms of the prism module;

6 a plurality of ferroelectric liquid crystal panels,
7 respectively placed on emerging surfaces of the various
8 wavelength ranges of light beams, to reflect the various
9 wavelength ranges of light beams to the prism module; and

10 a power supply, respectively connected to the plurality of
11 ferroelectric liquid crystal panels, for fast-switching the
12 liquid crystal panels, respectively, to sequentially emit the
13 various wavelength ranges of light beams from the prism module.

1 5. The color-separating device as claimed in claim 4
2 wherein the prism module includes six dichroic prisms.

1 6. The color-separating device as claimed in claim 4
2 wherein the power supply is a continuous pulse source.

1 7. The color-separating device as claimed in claim 4
2 wherein the number of the ferroelectric liquid crystal panels
3 is 3.

1 8. The color-separating device as claimed in claim 4
2 wherein the various wavelength ranges include the wavelength
3 ranges of red light, green light and blue light.

1 9. The color-separating device as claimed in claim 5
2 wherein the dichroic prism is replaced by a dichroic mirror.

1 10. A fast time-sequential color-separating liquid crystal
2 projector including:

3 a prism module that separates an incident light into
4 various wavelength ranges of light beams which are emitted from
5 various prisms of the prism module;

6 a plurality of ferroelectric liquid crystal panels,
7 respectively placed on emerging surfaces of the various
8 wavelength ranges of light beams, to reflect the various
9 wavelength ranges of light beams to the prism module; and

10 a power supply, respectively connected to the plurality of
11 ferroelectric liquid crystal panels, fast-switching the liquid
12 crystal panels, respectively, to sequentially emit the various
13 wavelength ranges of light beams from the prism module;

14 a display module that receives and modulates the various
15 wavelength ranges of light beams sequentially emitted from the
16 prism module and then projects modulated light beams.

1 11. The liquid crystal projector as claimed in claim 10
2 wherein the display module is a single panel of transmissive
3 liquid crystal light valve.

1 12. The liquid crystal projector as claimed in claim 10
2 wherein the display module is a single panel of reflective liquid
3 crystal light valve.

1 13. The liquid crystal projector as claimed in claim 10
2 wherein the various wavelength ranges include the wavelength
3 ranges of red light, green light and blue light.

1 14. The liquid crystal projector as claimed in claim 10
2 wherein the prism module includes six dichroic prisms.

1 15. The liquid crystal projector as claimed in claim 10
2 wherein the number of the ferroelectric liquid crystal panels
3 is 3.

1 16. The liquid crystal projector as claimed in claim 10
2 wherein the power supply is a continuous pulse source.

1 17. The liquid crystal projector as claimed in claim 11
2 wherein the liquid crystal light valve is a ferroelectric liquid
3 crystal light valve.

1 18. The liquid crystal projector as claimed in claim 12
2 wherein the liquid crystal light valve is a ferroelectric liquid
3 crystal light valve.